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(54) **Electric module latch assembly**

Verriegelungsvorrichtung für ein elektrisches Modul

Ensemble de verrouillage pour module électrique

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Description

Many electrical assemblies include a number of modules removably mounted into a main housing. These modules often carry electrical connectors which engage mating connectors in the housing when the module is fully inserted into the housing. One concern is to insure that the appropriate electrical connections are broken during a no-load condition. U.S. Patent No. 3,919,507 discloses an interlock system which permits the power switch to be actuated only when the two units have been interconnected. This has also been accomplished in the past through the automatic actuation of an external power switch on the module whenever the module was to be removed or replaced. See U.S. Patent No. 4,777,332. US 4071722, on which the precharacterising portion of appended claim 1 is based, discloses a module having a lever which operates in conjunction with a bar on the housing to move the module into and out of the connection. The module has a switch which is biased in an OFF state and which is operable remotely by means of a member which will latch in an enabling position holding the switch in an ON state. The member interacts with the lever such that it cannot be moved to the enabling position unless the lever is in its connecting position and is released from its latch if the lever is moved from its connecting position.

It may be noted that, from the field of furniture, more specifically cabinets, GB-A-1108678 discloses a latch mechanism for the drawer of a cabinet, the latch comprising a lever having a lower portion which engages with a keeper on the cabinet to pull the drawer in and having an upper portion which engages with a catch in the drawer when the drawer is fully pulled in.

According to the present invention, there is provided a latch assembly for use with an electric module mounted within a housing, the electrical module including an enable switch, the latch assembly comprising:

- a lever having a latch end and being pivotally secured relative to the module for pivotal movement in latching and unlatching rotary directions between a latched position and an unlatched position;
 - a keeper, having a latch surface to be mounted to the housing;
 - the latch end of the lever including latch means for engaging the latch surface to pull the module into and force the module from the housing when the lever is rotated in the latching and unlatching directions, respectively; and
 - a disenable switch element movably mounted to engage the lever so as to move between enable and disenable positions as the lever is moved away from the latched position, the disenable switch element only being able to actuate the enable switch carried by the module when the lever is in the latched position; characterised in that:
- said latch assembly comprises a U-shaped handle

having a first leg, a second leg and a bight connecting the first and second legs, the first and second legs secured to the module, the handle defining a handle plane, the latch end being pivotally secured to the handle for pivotal movement along the handle plane, the latched position being generally parallel to the bight, the unlatched position extending away from the bight and the lever sized so that the latch end is adjacent the first leg when the lever is in the latched position;

said lever further comprises a catch end and said latch assembly further comprises:

a catch button having a first catch, facing the catch end, movably mounted to the handle for movement between engaged and disengaged positions; the catch end including a second catch configured for mating engagement with the first catch when the first catch is in the engaged position and the lever is in the latched position so to prevent movement of the lever in the unlatching direction; and said disenable switch element is spring biased and includes an elongate pin mounted to the handle, the elongate pin having an outer end positioned to engage a lower surface of the lever, and being sized to extend to the enable switch such that when said lever is moved between the latched and unlatched positions, said disenable switch element is biased away from the enable switch and when said lever is moved between the unlatched and latched positions, said disenable switch element contacts said lever portion and is moved thereby to actuate the enable switch.

The disenable switch pin may be mounted in the handle to engage the lever, preferably at the outer, latch end of the lever. The disenable switch pin is then spring biased against the lever. When the lever is in the latched position, the lever keeps the disenable switch pin depressed against the force of the spring bias. The pin is long enough to engage an enable switch, typically mounted within the interior of the module. Thus, when the lever is released by moving the catch button, the disenable switch pin moves outwardly, pushes the latch end of the lever away from the handle and releases the enable switch. The released enable switch completely, or at least partially, electrically isolates the module from the housing.

The user then continues moving the catch-end of the lever away from the handle; this causes the U-shaped internal camming surface at the latch end of the lever to push against the keeper thus driving the module from the housing. In this way, any electrical circuits are properly interrupted, due to the release of the enable switch, prior to the actual removal of the module from the housing and thus prior to the disconnection of electrical connectors carried by the module and the housing.

The keeper is preferably mounted to the housing so that it can move a short distance towards and away from

the housing while being spring biased towards the housing.

The disenable switch pin and the spring biased keeper both tend to pivot the lever in the unlatching direction when the lever is in the latch position. Actuating the catch button to release the lever permits the lever to pivot in the unlatching direction. However, the spring biasing forces of the disenable switch pin and keeper do not necessarily tend to force a module away from the housing but rather merely pivot the lever to a position where it can be grasped by the user. The user's further pivoting of the lever in the unlatching direction causes the U-shaped latch surface at the latch end of the lever to drive the module away from the housing, preferably a distance sufficient to disconnect the electrical connectors.

Because of the angle of engagement of the catch-button catch and the catch at the catch-end of the lever, the lever must be biased slightly in the latching direction (against the biasing forces of the disenable switch pin and the keeper) before the two catches release to allow the lever to pivot freely in the unlatching direction. Thus, when the lever is in the latched position with the two catches engaged, it is a stable position to help ensure continuous engagement of the electrical module within the housing until the user actively disengages the catch button from the catch end of the lever.

Another preferred feature with the invention is the use of the spring-biased keeper. This ensures a sufficient force is exerted between the cam-latch surface and the keeper so to maintain the engagement force between the reverse angle catch of the catch button and the mating reverse angle catch of the lever regardless of the presence or absence of the disenable switch pin. The biasing force of the keeper is preferably sufficient to overcome the frictional insertion forces of the mating connectors.

With the invention is the recognition of the desirability for a latch assembly to include each of the following features: a strong carrying handle, positive latching, and the automatic operation of a disenable switch pin during latching and unlatching for no load engagement and disengagement of connectors. The present invention may fulfill each of these requirements in a straightforward manner.

Other features and advantages of the present invention will appear from the following description in which the preferred embodiment has been set forth in detail in conjunction with the accompanying drawings.

Fig. 1 is a simplified representation showing a latch assembly made according to the invention mounted to a housing and to an electrical module.

Fig. 2 is an exploded isometric assembly of the latch assembly of Fig. 1 shown in conjunction with an enable switch which is mounted within the electrical module of Fig. 1.

Figs. 3 is an enlarged cross-sectional view of the assembly of Figs. 1 and 2, with the lever in the latched

position.

Figs. 4A and 4B are simplified partial side views of the lever, catch button, and keeper of Fig. 3, shown with the electrical module mounted to the housing with the lever in two intermediate positions.

Fig. 4C shows the catch end of the lever and the bight of the keeper with the lever pivoted fully in the unlatching direction.

Referring now to Figs. 1, 2, and 3, a latch assembly 2 is shown to include a latch handle assembly 4 mounted to an electrical module 6 and a keeper 8 mounted to a housing 10. Electrical module 6 is of the type including an electrical connector 12 which engages a mating electrical connector 14 within housing 10. Module 6 is sized to fit within an opening 16 in housing 10. Connectors 12, 14 are positioned so that when module 6 is fully inserted within housing 10, connectors 12, 14 mate.

Latch assembly 4 includes a U-shaped handle 18 having first and second legs 20, 22 and a bight 24 connecting the outer ends 26, 28 of legs 20, 22. Handle 18 is secured to module 6 through the use of screws (not shown) which pass through appropriate holes in module 6 and into threaded holes 32, 34 in legs 20, 22.

Handle 18 defines a slot 36 extending along bight 24. Slot 36 connects a rectangular first open region 38 formed in first leg 20 and an open-ended, arcuate bottomed second open region 40 formed in second leg 22. An elongate lever 42 having a catch end 44 and an enlarged latch end 46 is pivotally mounted to second leg 22 by a roll pin 48, which passes through corresponding openings second leg 22 and latch end 46. Assembly 4 also includes a spring-loaded catch button 50 which is pivotally mounted to first leg 20 through a roll pin 52 passing through appropriate openings in first leg 20 and catch button 50. Catch button 50 has a reverse angle catch 54 size to engage a mating catch 56 at the catch end 44 of lever 42. Reverse angle catch 54 of catch button 50 is biased towards catch end 44 by a spring 58. One end of spring 58 is partially housed within a blind hole 60 in catch button 50 and the other is pressed against an inner wall 62 of first open region 38.

Latch end 46 includes a U-shaped camming surface 64 sized and positioned to engage the bight 66 of keeper 8, bight 66 defining a latch surface. Lever 42 is shown in its latched position, generally parallel to bight 24, in Fig. 3, at first and second intermediate positions in Figs. 4A and 4B, and at its unlatched position in Fig. 4C. In viewing these figures, it is seen how camming surface 64 engages bight 66 of keeper 8 so to push electrical modules 6 away from housing when moving from the latched position of Fig. 3 to the unlatched position of Fig. 4C. The reverse is also true; that is, camming surface 64 pulls electrical module 6 into housing 10 as lever 42 is moved from the unlatched position of Fig. 4C to the latched position of Fig. 3.

Keeper 8 includes elongate legs 69, over which springs 70 are mounted, to spring bias bight 66 towards housing 10. Keeper 8, when lever 42 is in the latched

position of Fig. 3, tends to rotate lever 42 in an unlatching direction 68 thus forcing catch 56 into engagement with catch 54.

Latch assembly 4 also includes a disenable switch pin 72 mounted within a guidehole 74 formed in first leg 20. A spring 76, mounted over pin 72, biases switch pin 72 so the outer end 78 of pin 72 presses against the underside 80 of lever 42 at catch end 44. This is achieved in the preferred embodiment by capturing spring 76 between a counterbored shoulder 82 adjacent guide hole 74 and a clip 84 secured to pin 72 at a groove 86 in pin 72. The amount of travel of pin 72 towards lever 42 is restricted by the engagement of a second clip 88, mounted within a second groove 90 in switch pin 72, with a second counterbored surface 92.

The inner end 94 of pin 72 is positioned to extend within module 6 opposite an enable switch 96 carried by the module. When lever 42 is in the latched position of Fig. 3, disenable switch pin 72 is biased by underside 80 of lever 42 so that inner end 94 engages enable switch 96. This permits normal operation of electrical module 6. However, when catch button 50 is rotated away from its engaged position of Fig. 3 to the disengaged position of Fig. 4A, spring 76 tends to rotate lever 42 in unlatching direction 68 (see Fig. 4B) so to permit inner end 94 of pin 72 to move away from enable switch 96 to release enable switch 96; the release of enable switch 96 at least partially electrically isolates module 6 from housing 10. (Of course, there may be some live circuits which are purposely not disabled by the release of enable switch 96.) This deactuating of enable switch 96 occurs before camming surface 64 begins to move electrical module 6 from within housing 10. This ensures that no load engagement and disengagement of connectors 12, 14 is achieved.

In use, assuming module 6 is external of housing 10 with lever 42 housed within slot 36, the user can hold module 6 by handle 18, align module 6 with opening 16 and slide the module part way into the interior of housing 10. Before module is fully inserted into housing 10, lever 42 is released by biasing catch button 50 away from the latched position of Fig. 3 in the direction of arrow 98 to a disengaged position, shown in Fig. 4A, to then allow lever 42 to pivot in unlatching direction 68 by the force of spring 76 as shown in Fig. 4B. Note, however, because of the reverse angle of catch 54 and leading catch 56, pivoting button 50 in the direction of arrow 98 initially causes lever 42 to pivot a short distance in latching direction 100 (as indicated in Fig. 4A) and against the bias of spring 76. This helps to keep lever 42 properly engaged with button 50 until the user actively disengages the two.

Once lever 42 is in the unlatched position of Fig. 4C, electronic module 6 is inserted further within housing 10 so that bight 66 of keeper 8 enters the U-shaped opening defined by U-shaped camming surface 64. Lever 42 is then rotated in latching direction 100 until lever 42 is in the latched position of Fig. 3; this movement

initially causes camming surface 64 to engage bight 66 in a manner which tends to force keeper 8 away from housing 10 against the bias of springs 70. After keeper 8 is fully extended, further movement of lever 42 in the latching direction 100 forces module 6 into housing 10, thus causing connectors 12, 14 to mate.

Catch end 44 of lever 42 includes an angled guide surface 102. When lever 42 is rotated in latching direction 100, guide surface 102 engages the outer edge 104 of button 50 to bias button 50 in the direction of arrow 98; continued movement of lever 42 in latching direction 100 permits button 50 to rotate back in the direction of an arrow 106 (see Fig. 4B) so that reverse angle catch 54 assumes a position opposite mating catch 56. Upon release of lever 42, spring 76 and springs 70 urge catch 56 against catch 54 thus securing module 6 to housing 10.

To remove module 6, the user presses on serrated surface 108 of button 50 to bias button 50 in the direction of arrow 98, thus releasing lever 42. Lever 42 is initially biased in unlatching direction 68 by springs 70, 76. The bias of the springs ceases when lever 42 is at an angle of about 20 degrees to bight 24. Simultaneously, during the initial movement of lever 42 in unlatching direction 68, disenable switch pin 72 is driven away from enable switch 96 by spring 76. This causes enable switch 96 to be released so to electrically isolate module 6 from housing 10 prior to the disconnection of connectors 10, 12. Further movement of lever 42 in unlatching direction 68 by the user causes camming surface 64 to push against bight 66, thus forcing electronic module 6 away from housing 10, thus disconnecting connectors 12, 14. The user can then pull on handle 18 to completely remove module 6 from housing 10.

Modification and variation can be made to the disclosed embodiment without departing from the subject of the invention as defined in the following claims.

40 Claims

1. A latch assembly (2) for use with an electric module (6) mounted within a housing (10), the electrical module including an enable switch (96), the latch assembly (2) comprising:

a lever (42) having a latch end (46) and being pivotally secured relative to the module for pivotal movement in latching and unlatching rotary directions between a latched position and an unlatched position;
a keeper (8), having a latch surface to be mounted to the housing (10);
the latch end (46) of the lever (42) including latch means for engaging the latch surface to pull the module into and force the module from the housing (10) when the lever (42) is rotated in the latching and unlatching directions, re-

- spectively; and
 a disenable switch element movably mounted to engage the lever (42) so as to move between enable and disenable positions as the lever (42) is moved away from the latched position, the disenable switch element only being able to actuate the enable switch (96) carried by the module when the lever is in the latched position; characterised in that:
 said latch assembly comprises a U-shaped handle (18) having a first leg (20), a second leg (22) and a bight (24) connecting the first and second legs, the first and second legs secured to the module, the handle (18) defining a handle plane, the latch end (46) being pivotally secured to the handle (18) for pivotal movement along the handle plane, the latched position being generally parallel to the bight (24), the unlatched position extending away from the bight (24) and the lever (42) sized so that the latch end (46) is adjacent the first leg (20) when the lever (42) is in the latched position;
 said lever further comprises a catch end (44) and said latch assembly further comprises:
 a catch button (50) having a first catch (54), facing the catch end (44), movably mounted to the handle (18) for movement between engaged and disengaged positions;
 the catch end (44) including a second catch (56) configured for mating engagement with the first catch (54) when the first catch (54) is in the engaged position and the lever (42) is in the latched position so to prevent movement of the lever (42) in the unlatching direction; and
 said disenable switch element is spring biased and includes an elongate pin (72) mounted to the handle (18), the elongate pin having an outer end (78) positioned to engage a lower surface (80) of the lever, and being sized to extend to the enable switch (96) such that when said lever (42) is moved between the latched and unlatched positions, said disenable switch element is biased away from the enable switch and when said lever (42) is moved between the unlatched and latched positions, said disenable switch element contacts said lever portion (80) and is moved thereby to actuate the enable switch (96).
2. The latch assembly of claim 1 wherein the bight (24) of the handle includes a slot (36) for at least partially housing the lever (42) when the lever (42) is in the latched position.
 3. The latch assembly of claim 1 or 2 wherein the first leg (20) includes an open interior region (38) within which at least a portion of the catch button (50) is housed.

4. The latch assembly of claim 1, 2 or 3 wherein the catch button (50) is a spring biased catch button biased towards the engaged position.
5. The latch assembly of any preceding claim wherein the latch means includes a U-shaped internal surface (64) configured to engage the latch surface of the keeper (8).
6. The latch assembly of any preceding claim wherein the keeper (8) is generally U-shaped.
7. The latch assembly of any preceding claim wherein the latch end (46) of the lever (42) is pivotally secured to the second leg (22) of the handle.
8. The latch assembly (2), of any one of claims 1 to 7 further comprising:

means for biasing the latch surface towards the housing (10); and wherein
 the lever (42) has a lower surface (80); and
 the disenable switch element includes a spring biased elongate pin (72), including outer and inner ends (78,94), movably mounted to the handle so the outer end (78) engages the lower surface (80) of the lever (42) so to move between enable and disenable positions as the lever (42) is moved between the latched and unlatched positions, respectively, the elongate pin (72) sized so the inner end (94) extends into the module to actuate the enable switch (96) carried by the module only when the elongate pin (72) is in the enable position.

9. The latch assembly of any preceding claim wherein the keeper (8) includes springs (70) mounted to the keeper, the springs adapted to resiliently mount the latch surface to the housing (10).

Patentansprüche

1. Verriegelungsvorrichtung (2) zur Verwendung bei einem elektrischen Modul (6), das innerhalb eines Gehäuses (10) angebracht ist, welches elektrische Modul einen Auslöseschalter (96) enthält, wobei die Verriegelungsvorrichtung (2) enthält:

einen Hebel (42), der ein Verriegelungsende (46) hat und zur Drehbewegung in Verriegelungs- und Entriegelungs-Drehrichtungen zwischen einer verriegelten Position und einer entriegelten Position relativ zum Modul drehbar befestigt ist,
 einen an dem Gehäuse (10) anzubringenden Halter (8), der eine Verriegelungsfläche hat, wobei das Verriegelungsende (46) des Hebels

(42) Verriegelungseinrichtungen zum Eingriff mit der Verriegelungsfläche enthält, um das Modul zu ziehen in das und um das Modul zu drängen aus dem Gehäuse (10), wenn der Hebel (42) in die Verriegelungs- bzw. Entriegelungsrichtungen gedreht wird, und

ein Sperr-Schaltelement, das beweglich angebracht ist, um mit dem Hebel (42) in Eingriff zu kommen, um sich zwischen Auslöse- und Sperrpositionen zu bewegen, so wie der Hebel (42) von der verriegelten Position weg bewegt wird, wobei das Sperr-Schaltelement nur in der Lage ist, den Auslöseschalter (96), der von dem Modul getragen wird, zu betätigen, wenn der Hebel in der verriegelten Position ist, dadurch gekennzeichnet, daß:

die Verriegelungsvorrichtung einen U-förmigen Henkel (18) enthält, der ein erstes Bein (20), ein zweites Bein (22) und einen Bügel (24) hat, der die ersten und zweiten Beine verbindet, welche ersten und zweiten Beine an dem Modul befestigt sind, wobei der Henkel (18) eine Henkelebene bestimmt, das Verriegelungsende (46) zur Drehbewegung längs der Henkelebene drehbar an dem Henkel (18) befestigt ist, die verriegelte Position allgemein parallel zu dem Bügel (24) ist, die entriegelte Position sich von dem Bügel weg erstreckt, und der Hebel (42) von solcher Größe ist, daß das Verriegelungsende (46) nahe dem ersten Bein (20) ist, wenn der Hebel (42) in der verriegelten Position ist,

der Hebel ferner ein Halteende (44) enthält und die Verriegelungsvorrichtung ferner enthält:

einen Halteknopf (50), der einen dem Halteende (44) zugewandten ersten Haken (54) hat, der an dem Henkel (18) zur Bewegung zwischen ineinandergreifenden und ausgerückten Positionen beweglich angebracht ist, wobei das Halteende (44) einen zweiten Haken (56) enthält, der zum passenden Eingriff mit dem ersten Haken (54) konfiguriert ist, wenn der erste Haken (54) in der eingreifenden Position ist und der Hebel (42) in der verriegelten Position ist, um eine Bewegung des Hebels (42) in der Entriegelungsrichtung zu verhindern, und

wobei das Sperr-Schaltelement federvorgespannt ist und einen länglichen Stift (72) enthält, der an dem Henkel (18) angebracht ist, welcher längliche Stift ein äußeres Ende (78) hat, das angeordnet ist, um mit einer unteren Fläche (80) des Hebels in Eingriff zu kommen, und so groß ist, um sich bis zum Auslöseschalter (96) zu erstrecken, so daß, wenn der Hebel (42) zwischen den verriegelten und entriegelten Positionen bewegt wird, das Sperr-Schaltelement von dem Auslöseschalter weg gespannt wird, und, wenn der Hebel (42) zwi-

schen den entriegelten und verriegelten Positionen bewegt wird, das Sperr-Schaltelement den Hebelteil (80) berührt und dadurch bewegt wird, um den Auslöseschalter (96) zu betätigen.

2. Verriegelungsvorrichtung nach Anspruch 1, wobei der Bügel (24) des Henkels einen Schlitz (36) enthält, um den Hebel (42) zumindest teilweise aufzunehmen, wenn der Hebel (42) in der verriegelten Position ist.
3. Verriegelungsvorrichtung nach Anspruch 1 oder 2, wobei das erste Bein (20) einen offenen Innenbereich (38) enthält, innerhalb dem wenigstens ein Teil des Halteknopfs (50) untergebracht ist.
4. Verriegelungsvorrichtung nach Anspruch 1, 2 oder 3, wobei der Halteknopf (50) ein federvorgespannter Halteknopf ist, der in die Eingriffsposition vorgespannt ist.
5. Verriegelungsvorrichtung nach einem der vorhergehenden Ansprüche, wobei die Verriegelungseinrichtungen eine U-förmige Innenfläche (64) enthalten, die konfiguriert ist, um mit der Verriegelungsfläche des Halters (8) in Eingriff zu kommen.
6. Verriegelungsvorrichtung nach einem der vorhergehenden Ansprüche, wobei der Halter (8) allgemein U-förmig ist.
7. Verriegelungsvorrichtung nach einem der vorhergehenden Ansprüche, wobei das Verriegelungsende (46) des Hebels (42) drehbar an dem zweiten Bein (22) des Henkels befestigt ist.
8. Verriegelungsvorrichtung (2) nach einem der Ansprüche 1 bis 7, ferner enthaltend:

Einrichtungen zum Vorspannen der Verriegelungsvorrichtung zum Gehäuse (10) hin, und wobei

der Hebel (42) eine untere Fläche (80) hat, und das Sperr-Schaltelement einen federvorgespannten, äußere und innere Enden (78, 94) enthaltenden länglichen Stift (72) enthält, der an dem Henkel beweglich angebracht ist, so daß das äußere Ende (78) mit der unteren Fläche (80) des Hebels (42) in Eingriff ist, um sich zwischen Freigabe- und Sperr-Positionen zu bewegen, so wie der Hebel (42) zwischen den verriegelten bzw. unverriegelten Positionen bewegt wird, wobei der längliche Stift (72) von solcher Größe ist, daß sich das innere Ende (94) in das Modul hinein erstreckt, um den Auslöseschalter (96), der von dem Modul getragen wird, nur zu betätigen, wenn der längliche Stift

(72) in der Freigabeposition ist.

9. Verriegelungsvorrichtung nach einem der vorhergehenden Ansprüche, wobei der Halter (8) Federn (70) enthält, die am Halter angebracht sind, wobei die Federn ausgelegt sind, um die Verriegelungsfläche elastisch am Gehäuse (10) anzubringen.

Revendications

1. Ensemble de verrouillage (2) pour utilisation avec un module électrique (6) monté à l'intérieur d'un châssis (10), le module électrique comprenant un interrupteur de validation (96), l'ensemble de verrouillage (2) comprenant :

un levier (42) ayant une extrémité de verrouillage (46) et étant fixé de manière pivotante par rapport au module pour un mouvement pivotant dans les sens rotatifs du verrouillage et du déverrouillage entre une position verrouillée et une position déverrouillée ;

un dispositif de retenue (8) ayant une surface de verrouillage à monter sur le châssis (10) ; l'extrémité de verrouillage (46) du levier (42) comprenant des moyens de verrouillage pour venir en prise avec la surface de verrouillage pour enfoncer le module dans le châssis (10) et retirer le module hors du châssis (10) lorsque le levier (42) est tourné dans les sens du verrouillage et du déverrouillage, respectivement ; et

un élément formant interrupteur d'invalidation, monté de façon mobile pour venir en prise avec le levier (42), de façon à se déplacer entre des positions de validation et d'invalidation lorsque le levier (42) est écarté de la position verrouillée, l'élément formant interrupteur d'invalidation étant seulement susceptible d'actionner l'interrupteur de validation (96) porté par le module lorsque le levier est dans la position verrouillée ; caractérisé en ce que :

ledit ensemble de verrouillage comprend une poignée en forme de U (18) ayant une première branche (20), une seconde branche (22) et une anse (24) reliant les première et seconde branches, les première et seconde branches étant fixées au module, la poignée (18) définissant un plan de poignée, l'extrémité de verrouillage (46) étant fixée, de manière pivotante, à la poignée (18) pour un mouvement pivotant dans le plan de poignée, la position verrouillée étant globalement parallèle à l'anse (24), la position déverrouillée s'écartant de l'anse (24) et le levier (42) étant dimensionné de sorte que l'extrémité de verrouillage (46) soit adjacente à la première branche (20) lorsque le levier (42) est

dans la position verrouillée ;

ledit levier comprend, de plus, une extrémité formant encoche (44) et ledit ensemble de verrouillage comprend, de plus :

un bouton de blocage (50) ayant une première encoche (54), faisant face à l'extrémité formant encoche (44), monté de façon mobile sur la poignée (18) pour un déplacement entre les positions de prise et de dégagement ;

l'extrémité formant encoche (44) comprenant une seconde encoche (56) conformée pour une mise en prise par enclenchement avec la première encoche (54) lorsque la première encoche (54) est dans la position en prise et que le levier (42) est dans la position verrouillée, de façon à empêcher le déplacement du levier (42) dans le sens du déverrouillage ; et

ledit élément formant interrupteur d'invalidation est poussé par un ressort et comprend un axe allongé (72) monté sur la poignée (18), l'axe allongé ayant une extrémité extérieure (78) positionnée de façon à venir en prise avec une surface inférieure (80) du levier, et étant dimensionné pour s'étendre vers l'interrupteur de validation (96) de sorte que, lorsque ledit levier (42) est déplacé entre les positions verrouillée et déverrouillée, ledit élément formant interrupteur d'invalidation est écarté de l'interrupteur de validation, et lorsque ledit levier (42) est déplacé entre les positions déverrouillée et verrouillée, ledit élément formant interrupteur d'invalidation vient en contact avec ladite partie de levier (80) et est déplacé, de ce fait, pour actionner l'interrupteur de validation (96).

2. Ensemble de verrouillage selon la revendication 1, dans lequel l'anse (24) de la poignée comprend une fente (36) pour loger au moins partiellement le levier (42), lorsque le levier (42) est dans la position verrouillée.

3. Ensemble de verrouillage selon l'une des revendications 1 ou 2, dans lequel la première branche (20) comprend une zone intérieure ouverte (38) à l'intérieur de laquelle au moins une partie du bouton de blocage (50) est logée.

4. Ensemble de verrouillage selon l'une des revendications 1, 2 ou 3, dans lequel le bouton de blocage (50) est un bouton de blocage poussé par un ressort vers la position en prise.

5. Ensemble de verrouillage selon l'une quelconque des revendications précédentes, dans lequel le moyen de verrouillage comprend une surface interne en forme de U (64) conformée pour venir en prise avec la surface de verrouillage du dispositif de retenue (8).

6. Ensemble de verrouillage selon l'une quelconque des revendications précédentes, dans lequel le dispositif de retenue (8) est globalement en forme de U. 5
7. Ensemble de verrouillage selon l'une quelconque des revendications précédentes, dans lequel l'extrémité de verrouillage (46) du levier (42) est fixée, de façon pivotante, à la seconde branche (22) de la poignée. 10
8. Ensemble de verrouillage (2) selon l'une quelconque des revendications 1 à 7, comprenant, de plus : 15
- des moyens pour pousser la surface de verrouillage vers le châssis (10) ; et dans lequel le levier (42) a une surface inférieure (80) ; et l'élément formant interrupteur d'invalidation comprend un axe allongé (72) poussé par un ressort, incluant des extrémités extérieure et intérieure (78, 94), monté de façon mobile sur la poignée, de sorte que l'extrémité extérieure (78) vienne en prise avec la surface inférieure (80) du levier (42) de façon à se déplacer respectivement entre des positions de validation et d'invalidation lorsque le levier (42) est déplacé entre les positions verrouillée et non verrouillée, l'axe allongé (72) étant dimensionné de sorte que l'extrémité intérieure (94) s'étende dans le module pour actionner l'interrupteur de validation (96) porté par le module seulement lorsque l'axe allongé (72) est dans la position de validation. 20 25 30
9. Ensemble de verrouillage selon l'une quelconque des revendications précédentes, dans lequel le dispositif de retenue (8) comprend des ressorts (70) montés sur le dispositif de retenue, les ressorts étant conçus pour monter, de façon élastique, la surface de verrouillage sur le châssis (10). 35 40
- 45
- 50
- 55

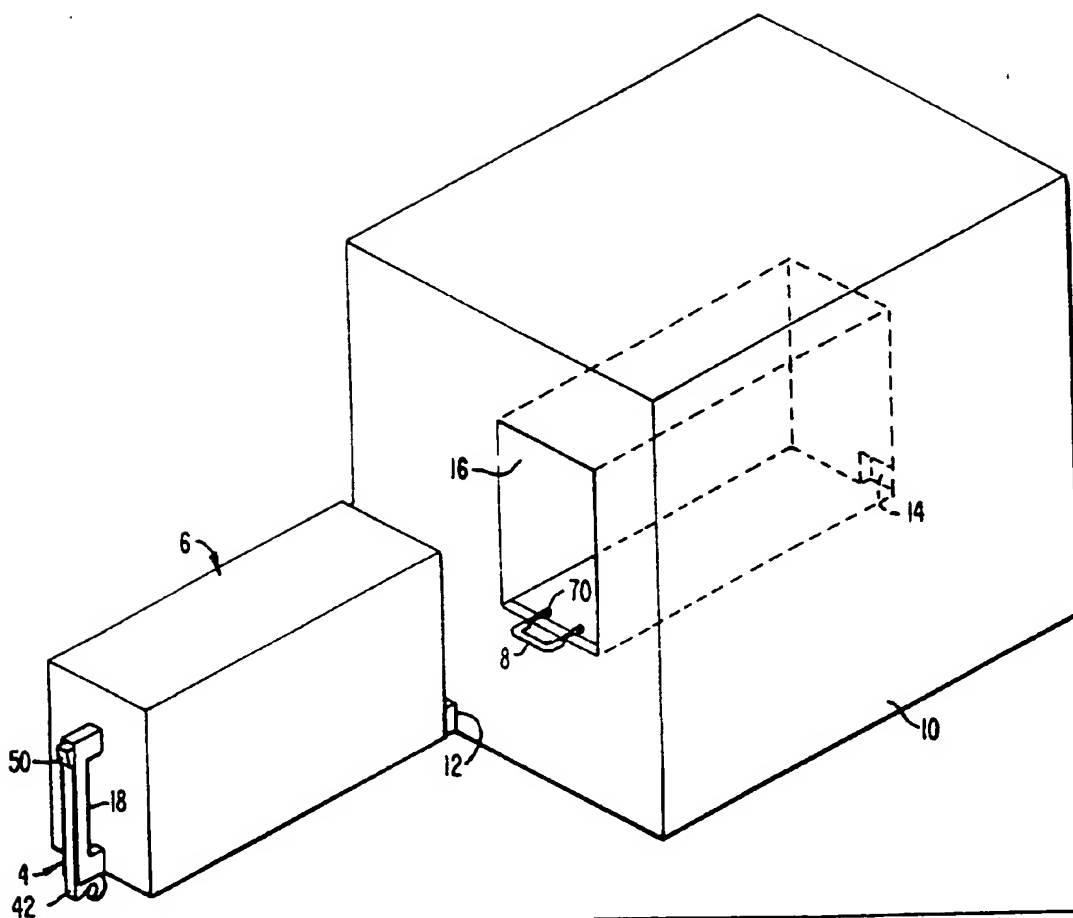


FIG. 1.

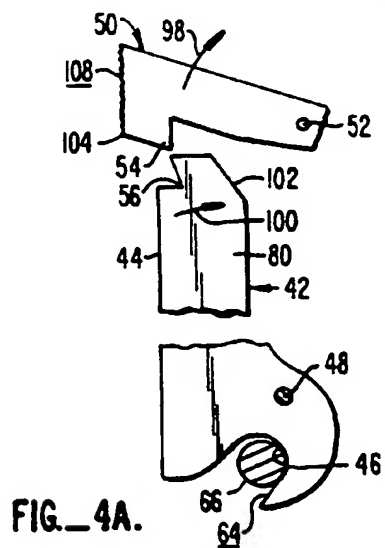


FIG. 4A.

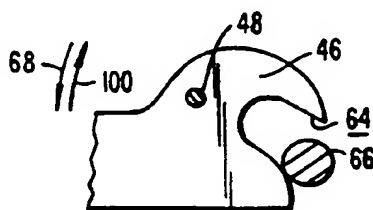


FIG. 4C.

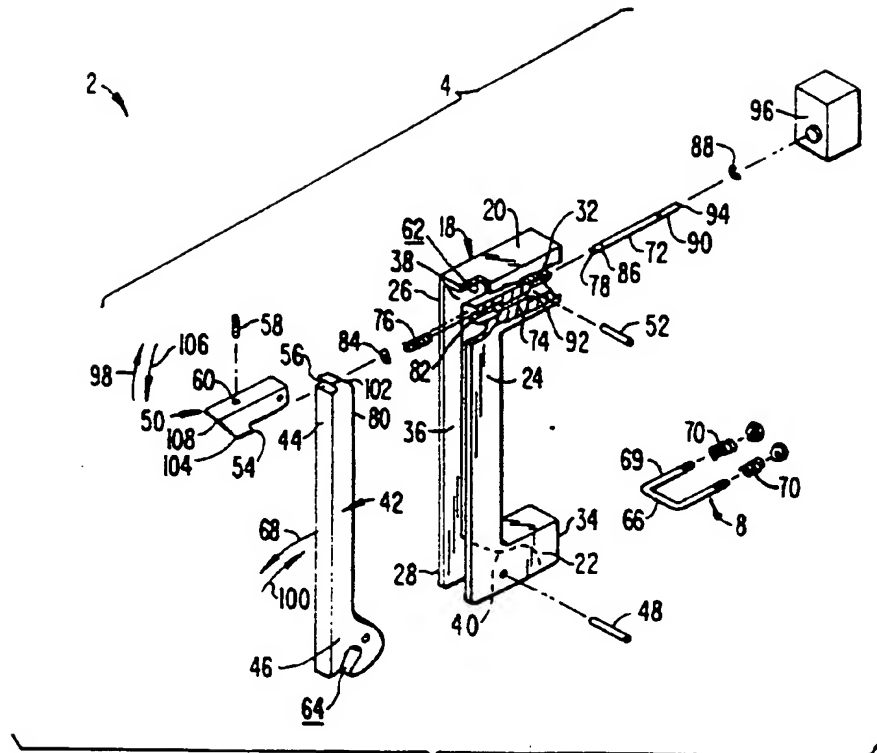


FIG. 2.

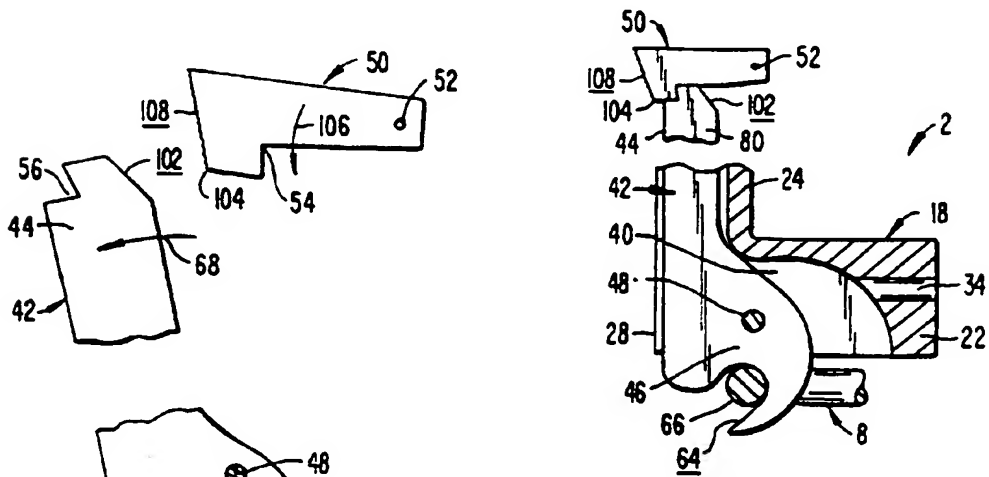


FIG. 3.

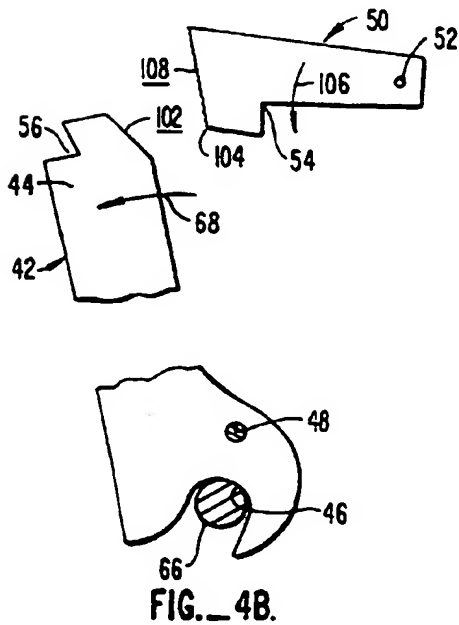


FIG. 4B.